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ARCHIVES OF PEDIATRICS

A MONTHLY DEVOTED TO THE

DISEASES OF INFANTS AND CHILDREN

JOHN FITCH LANDON, M.D., Editor

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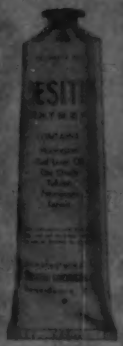

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1. Overall, J. C.: Southern M. J. 47:785, 1954. 2. Editorial: New England J. M. 246:111, 1952. 3. Grayzel, H. G., Heimer, C. B., and Grayzel R. W.: New York St. J. M. 53:2233, 1953. 4. Heimer, C. B., Grayzel, H. G., and Kramer, B.: Archives of Pediatrics 68:162, 1951. 5. Behrman, H. T., Combes, F. C., Bobroff, A., and Leviticus, K.: Ind. Med. & Surg. 18:512, 1949. 6. Turell, R.: New York St. J. M. 50:2282, 1950.

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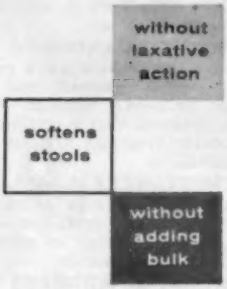

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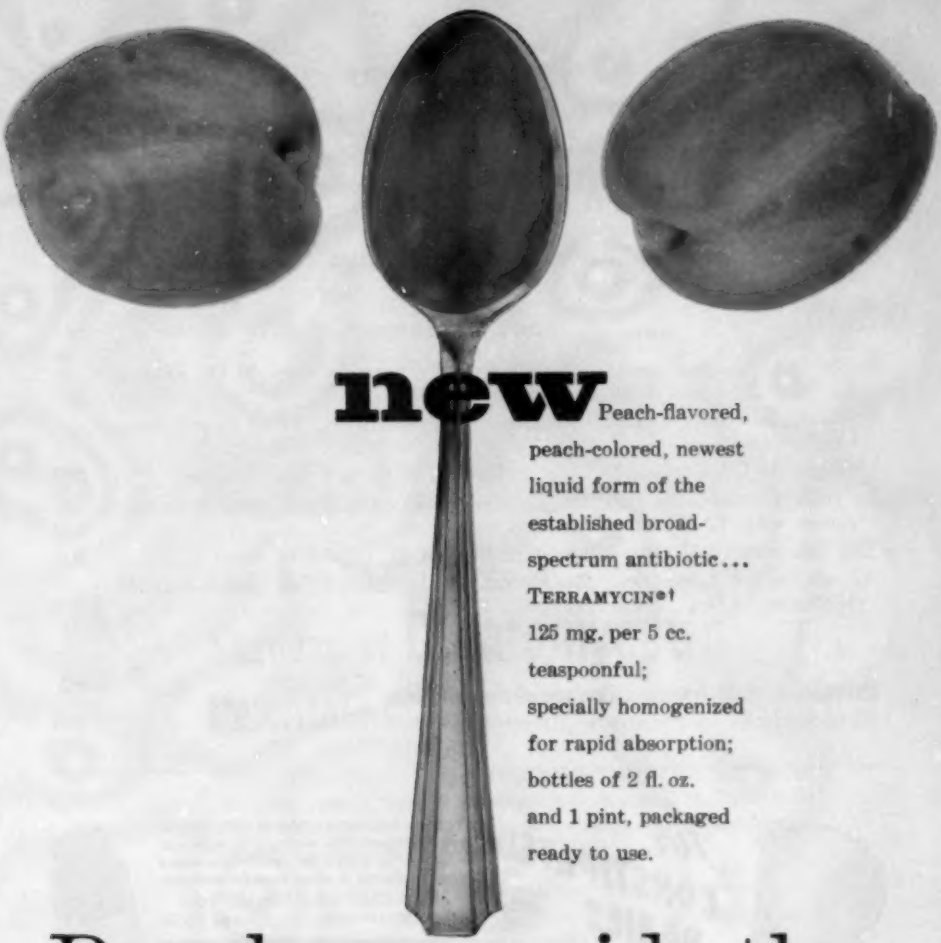

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ARCHIVES OF PEDIATRICS

Vol. 73 JULY 1956 No. 7

JOHN FITCH LANDON, M.D., Editor

THE USE OF MECLIZINE DIHYDROCHLORIDE WITH PYRIDOXINE IN VOMITING AND PYLOROSPASM IN INFANTS AND CHILDREN

HARRY R. LITCHFIELD, M.D.*
Brooklyn.

Disturbances of gastrointestinal origin, colic, vomiting and pylorospasm are constant sources of embarrassment to the physician treating infants and children.[1, 2] It has been proved that many of these complaints are not due to any recognizable pathologic condition, and are, therefore, commonly spoken of as of functional origin. Most of them, no doubt, eventually will be found to stem from recognizable physiologic disturbances. The gastrointestinal symptoms of vomiting, colic or pylorospasm are usually present in early infancy, but are not unusual in early childhood, and they cause just as much worry to the parents. In infants, pylorospasm may be the forerunner of pyloric stenosis.

From my own early experience as a pediatric pathologist, after studying, grossly and microscopically, the tissues of infants that came to autopsy[3] with the clinical diagnosis of hypertropic pyloric stenosis, I found that in only one was the mucous membrane swollen and invaginated into the duodenum, thereby occluding the pyloric orifice. The remainder, without exception, was found to be dilated and of the same size as in normal infants of the same age. Various authors in the past, such as Griffith[4] and Holt,[5] stated that the existence of persistent spasm of the pylorus without hypertrophy has yet to be proven.

Even if this is conceded, it is, obviously, no argument that the

*Director of Pediatrics at Brooklyn Womens Hospital and at East New York Dispensary.

spasm did not precede the hypertrophy. Indeed, if analogy means anything, such hypertrophy is prima facie evidence of antecedent spasm. Pylorospasm, therefore, should be corrected as soon as the symptoms become apparent in the infant.

CLINICAL METHODS

Our experience with the medication Bonadoxin Drops† in a series of twenty-seven patients, taken at random over a period of nine months, is hereby presented. Part of these cases were observed in a nursery service at the Brooklyn Doctors Hospital, which has approximately 1,000 cases a year. The other cases were observed in a follow-up clinic for infant care at the East New York Dispensary and in private practice.

Newborn and Early Infancy. Seventeen infants and newborn babies were treated orally with Bonadoxin Drops for control of vomiting associated with pylorospasm (16 cases) and upper respiratory infection (1 case). Intensity and duration of vomiting before institution of Bonadoxin Drops therapy varied from slight regurgitation to projectile vomiting and had extended over periods of 12 hours to 3 days.

Fifteen of the seventeen young patients were one week old or less. Of the two remaining, one was 2 months old and the other was 1½ years old. Dosage with Bonadoxin Drops varied from 5 to 15 drops three times a day, according to severity of symptoms. One infant was given 10 drops before each feeding. Results are shown in Table 1.

Table 1. *Vomiting in Infants and Newborn Babies*

Diagnosis	No. Cases	Symptoms Controlled Immediately	in 48 Hrs.	in 72 Hrs.
Pylorospasm	16	1	7	8
Respiratory Infection..	1		1	

Percentage efficacy: 53 per cent in 48 hours
100 per cent in 72 hours

Children. Ten patients, all suffering from nausea and vomiting associated with upper respiratory infection, were treated with Bonadoxin Drops as antiemetic therapy. Eight of the ten patients were in the 2 year to 4 year age group. One of the remaining children was 5 years old; the other, 9. The dosage was 15 drops

†Trademark of J. B. Roerig and Company (Division of Chas. Pfizer & Co., Inc.) for a product containing meclizine dihydrochloride, 25 mg., and pyridoxine hydrochloride, 50 mg., in each 3 cc.

three times a day in 9 cases, and 20 drops three times a day in the case of the 9-year-old child. Results are shown in Table 2.

Table 2. *Nausea and Vomiting in Children*

Diagnosis	No. Cases	Controlled in 24 Hrs.	in 48 Hrs.
Upper Respiratory Infection.....	10	...	10

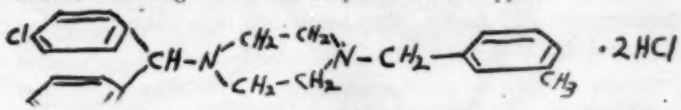
Percentage efficacy: 100 per cent in 48 hours
Over-all efficacy, Tables 1 and 2: 100 per cent in 72 hours or less.

CLINICAL RESULTS

The over-all results of this clinical evaluation of Bonadoxin Drops showed complete control of symptoms in each of the twenty-seven patients. There were no side effects; the liquid was accepted readily and tolerated well.

DESCRIPTION OF THE DRUG

Bonadoxin, a drug showing antiemetic and antispasmodic effects, demonstrates a unique approach in the treatment of nausea and vomiting associated with many physiological and pathological conditions, and in the treatment of pylorospasm and colic in infants. The ingredients of Bonadoxin, meclizine dihydrochloride and pyridoxine hydrochloride, provide dual therapy for the control of nausea, vomiting and infantile colic, by the central antiemetic and antispasmodic action of meclizine dihydrochloride, the site of action probably being the mid-brain, and by restoration of the physiological chemical balance of the body through nutritional therapy with pyridoxine hydrochloride (vitamin B_6). One of the ingredients of Bonadoxin, meclizine dihydrochloride, is a relatively new compound, providing both antihistaminic and anticholinergic activity. It has the particular advantage of prolonged duration of action. Despite its effectiveness and prolonged action, meclizine dihydrochloride produces an extremely low incidence of side effects, such as drowsiness, dry mouth, and blurred vision, which so often accompany other agents used in anti-nausea, antiemetic, antivertiginous and antispasmodic therapy.



Chemically, meclizine dihydrochloride is the dihydrochloride of 1-p-chlorobenzhydryl-4-methylbenzylpiperazine. It is relative insoluble in water and has the foregoing structural formula:

The other ingredient of Bonadoxin, pyridoxine (2-methyl-3-hydroxy-4, 5-di(hydroxymethyl)pyridine), is one of the most important of the B Complex vitamins, playing significant roles in the enzyme systems governing the metabolism of fats, carbohydrates and amino acids.

Bonadoxin Drops is a highly palatable, pale lime-colored, lime-flavored liquid containing a mixture of pyridoxine hydrochloride in solution, and a suspension of meclizine dihydrochloride.

DISCUSSION

The complete change in the clinical picture of the newborn infants, and the older children as well, who received the medication, influenced me to favor the use of this compound on the basis of its rapid effectiveness. This characteristic is to be desired, especially in view of the fact that increasing fretfulness, constant crying and vomiting, may alter the alimentary functions and quickly result in lowered intake of fluids, loss of weight and dehydration in infants.

It can be definitely stated that within a few hours, frequently soon after the first dose, improvement in the clinical picture was noted.

The antihistamine present in the medication may be the answer to the entire problem. It has been shown by Anrep[6], Ambache[7], Marcou,[8] Litchfield[9] and others that all types of muscles—skeletal, cardiac and smooth—liberate histamine during activity. There is no explanation for this interesting finding. It is certain that histamine must fit into something more than a theory of allergy. It was also noted that histamine increased the adrenal output of epinephrine, whose actions antagonize those of histamine. Perhaps the infants do not secrete enough epinephrine and, therefore, an antihistamine is necessary to control the colic, vomiting and pylorospasm not only in allergic manifestations, but also in physiological function.

This medication in tablet form and as Bonadoxin Drops has been successful in hyperemesis gravidarum[10, 11, 12]. There is now further evidence that this same medication is valuable in gastrointestinal dysfunction.

SUMMARY

Meclizine dihydrochloride with pyridoxine known as Bonadoxin Drops effectively relieved infantile colic, pylorospasm and vomit-

ing. It was effective almost immediately and well tolerated; there was no cumulative effect; and it was readily taken by dropper on the tongue, with water, or in fruit juice.

BIBLIOGRAPHY

1. Wessel, M. A.; Cobb, J. C.; Jackson, E. B.; Harris, G. S. and Detwiler, A. C.: Paroxysmal Fussing in Infancy, Sometimes Called "Colic". Pediatrics, 14: 421-435, Nov. 1954.
2. Levy, H. and Zweifler, B.: The Use of Banthine Bromide in Infantile Pylorospasm. Report of Nine Cases with X-Ray Study. J. Pediat., 42: 673-679, June 1953.
3. Litchfield, H. R.: Pylorospasm-Hypertrophic Pyloric Stenosis. M. Rec., 140: 470-471, Nov. 7, 1934.
4. Griffith, J. P. C.: The Diseases of Infants and Children, Vol. I, (Stenosis of the Plyorus), p. 709, 1919.
5. Holt, L. E. and Howland, J.: The Diseases of Infancy and Childhood, (Hypertrophic Stenosis of the Pylorus). 7th Ed., pp. 321-322, 1916.
6. Anrep, G. V.; Barsoum, G. S.; Salama, S. and Souidan, Z.: Liberation of Histamine during Reactive Hyperaemia and Muscle Contraction in Man. J. Physiol., 103: 297-305, Dec. 15, 1944.
7. Ambache, N. and Barsoum, G. S.: The Release of Histamine by Isolated Smooth Muscles. J. Physiol., 96: 139-145, July 1939.
8. Marcou, L.: The Cardiac Production of Histamine Depends on the Work Done by the Heart. (In French.) Compt. rend. Soc. de biol., 130: 575-577, Nov. 3, 1938; Ibid., pp. 573-577, Nov. 3, and pp. 586-588, Dec. 1, 1938.
9. Litchfield, H. R.; Bressler, N.; Maxursky, M. and Greenblatt, I. J.: Effects of an Antihistamine on Urinary Output. Am. Pract. & Digest Treat., 4: 104-107, Feb. 1953.
10. Weinberg, A. and Werner, W. E. F.: Bonadoxin: A New Effective Oral Therapy for Hyperemesis Gravidarum. Am. Pract. & Digest Treat., 6: 580-582, April, 1955.
11. Groskloss, H. H. et al.: Bonadoxin: A Unique Control for Nausea and Vomiting of Pregnancy. Clin. Med., 2: 885, Sept. 1955.
12. Tartikoff, G.: The Antiemetic Function of Bonadoxin in the Nausea and Vomiting of Pregnancy. Clin. Med., 3: 223, March 1956.

60 Plaza Street.

PREVENTION OF EPIDEMIC DIARRHEA OF THE NEWBORN. E. Jansen. (Maandschr. kindergeneesk., 23:424-431, Dec. 1955).

Janssen describes an epidemic of diarrhea in newborn infants that occurred in the nursery of a maternity hospital in Pretoria, South Africa. Eighteen of 62 babies in the nursery became ill with infectious diarrhea. To prevent the further spread of the epidemic, the system of placing all the newborn babies in one nursery was changed to the "rooming-in maternity plan." All healthy babies in their bassinets were placed and nursed at the bedsides of their mothers. After this was done, there were no new cases of infectious diarrhea. The 18 infants who had contracted the disease were nursed in an isolation ward. Four of them died despite treatment with sulfaguanidine, diet, intravenous fluids, and transfusions. The "rooming-in" plan has proved very satisfactory for seven years. The author feels that this observation is of importance, since epidemics are being observed in nurseries of newborn infants in other parts of the world. In South Africa, Mydocarditis neonatorum has appeared in epidemic form.

—*J.A.M.A.*

SICCA-CELL THERAPY IN CHILDREN*

HYMAN GOLDSTEIN, M.D., Sc.D.
New York.

Sicca-cell therapy, administered according to the method of its founder, Dr. Paul Niehans[1] of Switzerland is still in the clinical experimental stage although it had its beginning 25 years ago in 1931.

Investigating and evaluating this new therapeutic method of gland, organ, and tissue "dry cell aggregates," intramuscular injections for mentally retarded children, in a study of 48 cases I found improvement in the acceleration of the maturation processes of immature mannerisms, intelligence response, in their growth and general development.

Dr. Paul Niehans, a reputable surgeon and endocrinologist, who is also well known for his gland transplant work, could usually be found in the operating room or in his biological clinic and laboratory busily engaged in devising improved methods of administering gland and tissue transplants and implants to humans in the simplest and most effective way. Practically speaking, the ideas of Brown-Sequard, Voranoff, Steinach, and Alexis Carrel have been followed and improved upon.

Sicca-cell therapy originated with an emergency, a case of tetany in a dying woman whose parathyroids were accidentally removed during a thyroidectomy. Professor de Quervain, eminent internist, brought her to the Niehans clinic at Lake of Geneva, March 31, 1931 for consultation and emergency treatment for her tetany. The patient was very weak and moribund and too critically ill to have a parathyroid gland transplant operation under deep general anaesthesia. Dr. Niehans[1] conceived the idea of paring the fresh parathyroid gland, taken from a slaughtered calf the same morning and mixed with Ringer's solution into a fluid paste which he injected into the patient's thigh muscles. He took complete surgical aseptic precautions. At the time of this procedure, Dr. Niehans considered it only as an emergency, as a temporary step to relieve the patient with the thought in mind of following it up with a gland transplant operation at a later, more

* Lecture delivered April 14, 1956 before the Asociacion Medica Nacional de la Republica de Panama, and to the Medical staff at the New York Infirmary for Women and Children, Nov. 21, 1955.

propitious time. However, the patient responded immediately; the muscles relaxed, the tetany symptoms subsided and the patient made a quick recovery. For two decades Dr. Niehans kept her under close observation. She has remained well. There have been no relapses nor any further symptoms of the disease. She was the first patient to receive gland cell-aggregate therapy by injection. This was the beginning, the birth of sicca-cell therapy.

What are sicca-cell, "dry cell aggregates?" How are they prepared and what precautions are taken to prevent infection from animal to man? The sicca-cell or fresh dry cell preparations are taken from the organs of fetal or young animals, sheep usually are selected. Cesarean section is executed some weeks before full term delivery, the uterus is extracted as a whole, and the fetus is removed under strict aseptic conditions in the laboratory. The organs are dissected in the operating room and immediately placed in dry ice (a mixture of carbon dioxide snow plus acetone). The time between extraction and deep freezing is from forty to sixty minutes so that proteolytic fermentation is not possible. The preparations are then dried under extreme vacuum where so little moisture remains that proteolysis is not favored. Then the preparations are comminuted with the Turmix apparatus under absolute aseptic conditions, and finally, ampoules are filled under vacuum. The dosage, i.e., the material for each ampoule, has been measured to date by a volumetric method, but before long, it will be possible to distribute the quantity by weight so that each ampoule will contain a like dose. Each intramuscular injection of sicca-cells is similar to a gland or tissue transplant or implant. The cells are fresh and active when mixed with Ringer's solution and injected intramuscularly. Their peroxydase activity, proved by means of the Warburg apparatus, shows that the activity of the cell contents is intact. The safety of the product is safeguarded. The animals selected for organ extraction are isolated some time before slaughtering and placed under clinical, serological and bacteriological control. Tuberculin tests are made routinely to see if there are latent tuberculous foci. To detect brucellosis, serological and intradermopalpebral tests are carried out. If the results are questionable, cultures are made. Infection by salmonella is excluded in the same way. Virus and Rickettsia infections are avoided by serological investigations, and, if necessary, by experiments with animals. Serological investigation is also used to detect infections

by leptosporia and toxoplasmosis. After slaughtering, most of these trials are repeated on the animals. Blood samples are examined very carefully in veterinary control institutes to exclude all the cited diseases. Pathologic-anatomic control is also done. These investigations are routine, done by veterinarians and veterinary control institutes, as well as by Health Offices.

Sicca-cell experiments on animals were made at the following clinics: Professor Lettre[2] of the Cancer Research Institute of Heidelberg University injected cells carrying isotopes into pregnant and lactant animals and found the isotopes in the corresponding organs of the fetal and young animals. Professor Kaiserling[3] of the Pathologic-Anatomic Institute in Siegen, Germany has carried out experimental and morphologic investigations, following sicca-cell injections, on the lymphatic system. He showed that degenerated lymph nodes were regenerated after sicca-cell injection. At the same institute in experiments nephrosis was produced by means of arsenobenzol. The animals which had previously received kidney cell injections revealed only mild or moderate lesions of the tubuli, whereas the untreated controls showed severe necrosis of the tubuli. Goos[4] and Maishchein[5] of the Gynecological Clinic found that the injection of the corresponding gonads into castrated male rats prevented the formation of a castration hypophysis. In Finland, Teir,[6] has shown that experimental cell injections increased mitosis exclusively in the cells of the corresponding organ. Lorenz and collaborators[7] in the U.S.A. observed that injection of cells from the bone marrow of non-irritated animals can abolish the harmful effect of a total irradiation with a lethal x-ray dosage. This protection can only be obtained by means of cells and not by extracts of bone marrow. Marshak resected part of the liver in rats into which he injected radioactive liver cell nuclei of rats. He found increased radioactivity in the chromosomes of the liver of the recipients. Neumann injected cells of mice ovaries to ovarectomised mice and observed, for a long time, estrus phases with a normal rhythm. These experiments show that the injected sicca-cells of a gland, tissue, or an organ, intramuscularly into a patient will activate the cells of the corresponding gland, tissue, or organ, to produce improved or normal functions. The sicca-cell injections have been proved safe by prominent physicians, who have injected thousands of doses of sicca-cells of all types where indicated into many thousands of

patients with less than 0.1 per cent of side reactions. The procedure is a safe one. I shall refer to the extensive literature subsequently.

I refer here to a very interesting case of total transplant of thyroid gland using vascular anastomoses by Drs. Sterling and Goldsmith[8] into a woman, 28 years of age, blood type AB, Rh positive, who suffered from chronic tetany for a period of more than ten years following a thyroidectomy. She required 50 cc to 80 cc. of calcium gluconate daily, intravenously, in order to overcome the tetany. An attempt to transplant parathyroid tissue using the tissue culture technic, in 1949, was unsuccessful. She was admitted to the Northern Division of the Albert Einstein Medical Center on November 21, 1952, for the purpose of receiving a transplant of freshly procured thyroid gland tissue. The Pediatric Department was alerted. On the morning of November 21, 1952, a 3-week-old baby-boy died at 8.15 A.M., following a sudden decompression of a myelomeningocele. An operation for removal of his thyroid gland and blood vessels for the transplant began at 9.15 A.M.; the procedure of vascular anastomosis and reimplantation was completed at 2.30 P.M. Following the transplant, the patient's need for intravenous calcium injections remained almost unchanged for 8 days. The total blood protein dropped from 6.0 gram per cent to 5.0 gram per cent. It was brought up to normal levels by intravenous plasma and forced protein feedings, and no further medication was needed. The patient was taking small amounts of calcium by mouth and 2 cc. of viosterol daily. All medication was discontinued on December 11, 1952, except for oral calcium which was stopped January 6, 1953. Isotope (I-131) uptake was 9 per cent which showed normal thyroid transplant function on the eighth day. Blood calcium and phosphorus was normal, and protein 6.2 gram per cent. Radioactive iodine uptake on March 5, 1953 was 6.2 per cent, still showing fair thyroid function. The Sulkowitch test showed a slight trace of calcium. Basal metabolism was —9 per cent and cholesterin 280 mgm. per cent. A year and a half postoperatively, she remained free from symptoms of tetany and worked as a waitress. Tedious and exacting surgery was necessary in this case. Peer and Walker[9] pointed out that in accordance with Roux's law, a highly specialized tissue such as a secreting gland can continue to survive provided there is functional stimulation. They demonstrated that the vascular

system in free grafts tends to survive transplantation. We must also bear in mind that they used young thyroid cells since they were fortunate enough to obtain the thyroid of a three-week-old baby. The maintenance of viability is still operative one and one-half years after the gland transplant operation. Cantarow and others have indicated that only a few cells are needed in order to maintain the parathyroid function in the body. It is understood that the follow-up interval is a short one, nevertheless, there is sufficient evidence to indicate that the procedure was successful in that the symptoms of hypothyroidism and of hypoparathyroidism were relieved. The anastomoses of the carotid and jugular vessels to the host's vessels helped the gland with some nutrition until local circulation became adequate. Dr. Niehans case of chronic tetany, following injection of fresh parathyroid cells by a simple intramuscular injection, is still free from tetany symptoms after 20 years of postoperative observation.

Both methods are brilliant. Dr. Niehans procedure of administering sicca-cell intramuscular injections is a great improvement of gland and organ implantation as compared with the difficult operative method of tissue transplantation and vascular anastomosis. The activity of the sicca-cells when implanted is specifically for the stimulation of the same organ and ductless gland cells affected, pathologically and functionally, in the child. This stimulated cell activity in the patient continues for very long periods of time, i.e., for several months to several years.

Dr. Hellmut Haubold[10] of Munich, Germany, and co-workers, reported in the May 1955 issue of the Arztliche Forschung, and in a communication to me, that when they examined mothers of congenital acromicria syndrome children along with their children, for night blindness, they showed about 95 per cent subnormal hemeralopia curves, and especially high percentages of nyctalopia. The mongoloid children were found to be suffering from vitamin A deficiency. Breast milk and colostrum were found deficient in vitamin A and other fatty soluble vitamins and minerals. Therapeutically, the administration of fat soluble vitamins and minerals helped considerably to improve maturation. Dr. Haubold, et al. reported 125 cases of congenital acromicria syndrome in which he stressed the etiological and prophylactic factors. He stated also that when giving Dr. Niehans sicca-cell therapy it is necessary to continue the glandular hormone, vitamins A, C, D, B complex and

E, as well as mineral supplements by mouth with a proper high protein, moderate carbohydrate and low fat diet in order to accelerate maturation processes of the brain, bodily organs and tissues. This is in accordance with the author's experiences. A careful history of all children should be taken, a complete neurological examination should be made as well as a laboratory work-up, the Abderhalden urine proteinase tests and sensitive skin zones, known as the Head Dermatom zones, found in areas over diseased organs and glands of which Dr. Haubold made special studies. Sicca-cell therapy is indicated in accordance with the Abderhalden test results and findings, by the administration of specific ductless gland or organ sicca-cells to help correct the dysfunctioning ductless glands and organs. Dr. Haubold and associates report improved results in the physical development, intelligence, and social maturation. There were no side reactions of a very bothersome nature, nor any anaphylactic reactions. On March 9, 1956, Dr. Haubold wrote to me that he had 350 mongoloid children under treatment with sicca-cell therapy who show continual improvement. He also stated that he tested 25 mongoloid children previously treated along with mongoloids from a nearby institution, and on comparing the results, he found that the children who were treated with sicca-cell implantation by the injection method excelled in all maturation and intelligence examinations. Some of Dr. Haubold's colleagues in this arbeit are E. K. Frey, H. Kammerer, and A. E. Lampe of Munich, P. Gunther of Karlsruhe, W. Koll of Gottingen, and others.

At the 1953, 1954 and 1955 Therapie-Kongress verhandlungen über die Zellular-Therapie, held at Heidelberg, Germany, August 30 and 31, many eminent men read papers on the subject of sicca-cells which were discussed in open forum. A wealth of clinical and research material followed, appearing weekly and/or monthly in prominent medical publications, or were read before medical societies and at Therapie-Kongresses on sicca-cell therapie. The papers were freely discussed, with a majority favorably impressed with the good results therefrom.

I have before me a letter from Dr. Steven Zsako,[11] chief resident physician, of Euclid-Glenville Hospital, Euclid, Ohio, in which he writes: "We started our sicca-cell therapy in November 1955, and to date, we have treated 35 cases, the majority suffering from severe arteriosclerotic heart disease, with very good results." He

also sent me a report of 8 cases kept under observation for 3 months, and further stated that the results were very encouraging in 75 per cent of the cases treated, where all other methods had failed. "I hope that by June we will be able to inject approximately 50 patients. The present status of our clinical trial we will report in the form of a manuscript soon, and I shall be glad to send it to you." This is another instance where sicca-cell can be of value, clinically, in the treatment of another type or group of conditions.

Dr. Niehans[12] tells us, "that if cells belong to an aggregate, they have certain jobs to fulfill within this organization, and the cells, organs and system of organs show us wonderful co-operation, and function harmoniously in one unit." The human body is a living community of over 40 trillion cells. We know that the brain consists of 9 to 14 billion cells. We know also that only 15 per cent of our brain gray and white matter functions during our daily physical and mental activities, to take care of all our daily work and thinking. We still have a reservoir of 85 per cent of non-active or non-functioning areas of our brain to draw on in time of need. How can we invade this rich reservoir and draw upon it when we find ourselves brain injured through congenital acromicria syndrome (mongolism), or with other congenital brain lesions such as cerebral agnesis, atrophy or developmental arrest, in postencephalitis mental retardation of varying degrees, in brain cysts, blood vessel angiomata, glioma, tumors, cerebellar lesions, basal ganglia affections, brain hemorrhages and arachnoid adhesions, with or without epileptic seizures, and, with or without mild to severe mental retardation? The answer may be found, in part, in the results of the Abderhalden proteinase or endocrine urine tests, and in the Head Dermatom skin zone findings as an aid to our careful case history, neurological and laboratory tests of each child, including an electroencephalogram, and where indicated, a pneumoencephalogram to guide us in administering to the child the proper sicca-cell therapy to lessen brain pathology and to stimulate or help invade that huge, unused brain reservoir, and draw upon it to improve maturation of the infantile or immature structures and functions, to help mature the patient's mental responses, intelligence and result in balanced social mixing and activities.

THE ABDERHALDEN URINE PROTEINASE TEST

If the normal function of an endocrine gland or of an organ is disturbed, enzymes of the type of proteinases appear in the blood and urine which are specific for each of the diseased glands and each of the diseased organs. These proteinases can be demonstrated by allowing them to act on the protein obtained from the various glands and organs. They are called *substrates*, and must be prepared from human glands and organs. If, for example, there is disturbances of the thyroid gland function alone, then a proteinase is found in the blood and the urine which hydrolyses thyroid gland protein in vitro, but not protein from the pituitary, brain, liver or any other organ or tissue. It's specific only for the same gland, tissue, or organ protein.

An Abderhalden reaction is based on the detection of these specific proteinases. In carrying out the tests, the enzymes are first concentrated out of the urine by a procedure of adsorption. Then the proteinases are allowed to act on the various protein substrates for 16 hours at 37° C and pH 7.0. If specific proteinases are present in the urine, then the water-insoluble substrates concerned are broken down into water-soluble compounds, namely peptones, polypeptides and amino-acids. These breakdown products can be demonstrated in different ways, e.g., by estimation of the total nitrogen, amino-nitrogen or by color reactions. The latter is chosen, because the ninhydrin reaction is the most sensitive. Ninhydrin gives a violet color with the breakdown products. Depending on the intensity of the color measured against a control without a substrate, a distinction is made between a strongly positive reaction = +, a moderately positive reaction = (+), or a weakly positive reaction = ((+)), or, a negative reaction = −. This corresponds to a marked, moderate, slight, or absence of breakdown of gland or tissue protein, which in itself goes parallel to the approximate grade of disturbance of gland or organ function. If no breakdown of substrate occurs, this signifies that the gland or organ in question is functioning normally. These studies withstood very rigid critical tests as compared with control studies. It goes without saying that this method demands very accurate work, considerable time and great experience in the field of enzyme chemistry. Recovery of the proteins from various human glands and organs and their standardization are very laborious procedures and are practically impossible without exact knowledge of protein

and enzyme chemistry. This is the main reason why the Abderhalden reaction is still confined to a few special laboratories. Abderhalden blood tests are accurate because the concentration is always the same. The urine concentration varies at different times of the day, and differently in one patient compared to that of another. The results of the tests will, therefore, point to the area of dysfunction and will indicate the area that needs therapeutic attention. The result will be or can be considered qualitative in character rather than quantitative. This explains clinical and Abderhalden test result discrepancies that appear in some cases.

In 117 children of whom 39 children were of the congenital acromicria syndrome type (mongoloid group), 25 children were of a milder degree of mental retardation among the emotionally disturbed in the encephalopathic group, and 53 children were of the more severe types of brain lesion cases with and without epilepsy, including the different types of cerebral palsy with and without choreaform athetotic syndrome, all suffering from a more or less severe type of mental retardation. Their behavior patterns created many social and educational problems. All of the children of these various groups had urine examinations made by the Abderhalden Laboratory in Switzerland with interesting results. The 39 congenital acromicria children (mongoloid type), showed 10 mildly positive cerebral retarded functions, 28 mild to moderate hypothalamus reactions, 18 mild thalamus reactions, 39 mild to moderate thyroid reactions, 37 pituitary mild to moderate reactions, 17 thymus mild reactions, and 3 brain stem mild reactions. Note that 29 of this group did not show any cerebral lobe involvement as regards pathology, but they did show a great deal of pathway disturbances in the brain involving the thalamus, hypothalamus, brain stem, and endocrine disturbance involving the thyroid, pituitary, and the thymus glands which of course involves the suprarenals and gonads as well.

The 25 milder encephalopathic children, emotionally disturbed but with higher than 50 I.Q. mental ratings, showed the following Abderhalden urine results. Negative brain organ reactions, 23 hypothalamus mild to moderate reactions, 13 thalamus mild reactions, 3 thymus mild reactions, 9 brain stem mild to moderately strong reactions, 12 thyroid mild to moderate reactions, 20 pituitary mild to moderately strong reactions, one spinal cord, and one suprarenal mild reaction. These reactions, as mentioned, are inter-

preted to mean that the gland or organ is hypofunctioning to the degree mentioned.

The remaining 53 more severe types of encephalopathic children with lesions of congenital cerebral and cerebellar agenesis, cerebral partial and hemisphere atrophy, hydrocephalus, aplasias, cysts, angiomata, neonatal brain injuries and their results, prenatal, neonatal and postnatal cerebral anoxia lesions, and post-viral and bacterial encephalitic complications with and without palsy and epileptic seizures are included in this group. They showed 53 mild to moderate brain lobe reactions; in the majority of the cases, the urine reacted positively to the gray and white matter, involving one to four of the cerebral lobes. There were 37 mild to moderate hypothalamus reactions, 30 thalamus mild reactions, 24 brain stem mild to moderate readings, 27 pituitary gland, 13 thyroid gland and 2 thymus gland mild to moderate reports, one liver, one cartilage and one skeletal muscle mild reactions reported. As one studies these Abderhalden urine proteinase reports, the clinician realizes more and more the value of the tests as an additional guide to handling the case therapeutically. I have injected 48 acromicria syndrome children (mongoloid cases), including non-mongoloid mentally retarded children selected from the above groups, intramuscularly with sicca-cells of endocrine glands and of organs indicated by the Abderhalden urine test results in the hope that I could stimulate and revitalize their defective or hypofunctioning structures. They were given a total of 184 injections. Each child is examined to eliminate any infection, general or focal. The sicca-cell is injected using surgical asepsis. The autoclaved syringes and needles used were the 10 cc. syringe and 1¼ inch 18 to 19 gauge needles. The buttocks were swabbed on both complete areas with alcohol, then with topical phemerol. The sicca-cell ampoule is dipped in alcohol, then opened and emptied in the dry syringe barrel, the piston is placed, and the needle inserted at the other end, and 5 cc. Ringer's solution is drawn into the syringe. The syringe with its sicca-cell solution contents is shaken mildly for 5 minutes until the cell aggregates are broken up from the mass in solution and injected intramuscularly. This eliminates clogging of the needle. If clogging occurs, change the needle and the rest of the sicca-cell contents flows easily. There were no anaphylactic reactions, and very few side reactions such as local induration; in two cases there were a macular-papular rash, in three cases, a

mild 1 to 2 degrees rise in temperature which disappeared overnight. The children were ordered to remain in bed for three days following the injections. I usually injected one ampoule of sicca-cell in each buttock, but never more than two sicca-cells at one time, using two syringes and needles. Never mix different kinds of sicca-cells into one syringe. Use only one syringe for each sicca-cell gland or organ content for injection. The following are a few case reports of sicca-cell therapy from this series.

Case 1. Congenital acromicria syndrome. B.N., female, 9 years old, mongoloid appearance and mental retardation, treated with glandular therapy, glutamic acid, fat soluble vitamins and Aquasol E, vitamin C, B complex, minerals, and high protein, moderate carbohydrate low fat diet from 13 months of age until the present. The Abderhalden urine tests showed deficiency in thyroid, pituitary and hypothalamus. Up to this time, she did very well in school work, muscle coordination and agility, receiving 8 grains thyroid and 8 tablespoonfuls of 1 (+) glutamic acid daily. She could not do well on less. She received on June 14, 1955 one ampoule thyroid, and one ampoule pituitary sicca-cell into each buttock. On June 22, one ampoule hypothalamus intramuscularly, all under strictly surgical asepsis. She went to a regular camp for that summer and acted normal in every way without any therapy. She did not require any glutamic acid or thyroid. When she arrived home after the summer camp vacation, she contracted influenza, after which she required 1 to 3 grains thyroid and 1 to 3 tablespoons glutamic acid for optimum functional efficiency. On May 2, 1956 she received another thyroid ampoule in the buttocks. Her facial expression changed for the better, and the occiput rounded out. Her intelligence is excellent.

Case 2. J.R., male, 13 years. First seen by me in January 1953. Case of congenital acromicria syndrome (mongolism). Tonsils and adenoids were removed and he breathes, sleeps, and eats well. Feels very tired, marked muscle incoordination, speech defect and small vocabulary. I.Q. 40. The Abderhalden urine test showed deficiency function of the hypothalamus, thalamus, thyroid gland, and thymus, May 23, 1955. He received sicca-cell thyroid and thymus glands on June 19, and July 14, thalamus; on July 28, 1955, hypothalamus sicca-cells intramuscularly. He improved 50 per cent in I.Q.; his muscle coordination is excellent, he swims well and plays ball excellently. His occiput rounded out nicely,

and the mother states she takes him to the barber for a haircut without any objection, previously the back of his head looked very flat and funny. Now it's fine. He had no reactions to the injections.

Case 3. E.E., male, 9 years old. He visited me at the age of 7 years. He was mentally retarded and emotionally upset, developed physically to equal a 5-year-old, and mentally a 3½-year-old. Abderhalden urine test showed pituitary, thyroid and thymus deficiency, June 14, 1955. August 29, 1955, he received thyroid and thymus sicca-cell, and on January 15, 1956, he received pituitary gland sicca-cell injections. His intelligence and behavior improved remarkably well. His school report cards were satisfactory. His parents are very happy. He had no side reactions to the injections.

Case 4. A.M.J., female, 5 years old. Atonic form of cerebral palsy, no speech, flaccid muscles, very pale, helpless in every way. She was seen at the age of 4 years. She improved somewhat in muscle tone so she could sit up; supported with thyroid, pituitary, fat soluble vitamins, Aquasol E and minerals. May 7, 1955, her Abderhalden urine showed hypothalamus, thalamus, thymus, pituitary and thyroid gland deficiency. She received thalamus sicca-cell on July 14, 1955, and hypothalamus and thyroid sicca-cell on July 28; thymus and pituitary gland sicca-cell injections on August 18, 1955. She speaks short sentences, stands alone and takes a few steps by herself. She is toilet trained, feeds herself now, nearly one year post-sicca-cell therapy. She was pale for a few minutes, due I believe to emotional causes, her only reaction. She had no other reactions since.

Case 5. A.F., female, 6½ years old. First seen October, 1952. Congenital acromicria syndrome (mongoloid features). Abderhalden urine test September 17, 1955 showed hypothalamus, thalamus, pituitary, thyroid, and thymus deficiency. January 28, 1956, she received pituitary and thyroid; February 12, thymus gland, and on March 10, 1956, thalamus and hypothalamus sicca-cell injections intramuscularly. She showed marked improvement in vocabulary and expression, activity, occiput roundness, and in general maturation. She had no side reactions and no anaphylactic phenomena.

Case 6. P.R.M., female, 9-year-old. Mentally retarded, poor speech, muscle incoordination, athetotic, and emotionally, a serious problem. She received speech therapy irregularly. She was seen for the first time April 25, 1953. I.Q. 71, but because of her

athetotic behavior and emotional disturbance, learning became impossible. Abderhalden urine tests taken October 3, 1955 showed hypothalamus, thalamus, brain stem, and pituitary deficiency. December 23, 1955 she received hypothalamus and pituitary sicca-cells injections. Now, six months later, mother reported that her child is matured in behavior, is orderly, speaks well and plays with children. She is no longer wild. No reactions.

Case 7. M.B., female, 8 years old, was seen for the first time October 6, 1952. She is a congenital acromicria syndrome case (mongolism), spoke two to three words; walked at 18 months, eats alone, bed-wets, muscle coordination below normal. Abderhalden urine tests taken June 17, 1955, showed hypothalamus, pituitary, thyroid and thymus gland deficiency. She received thymus and thyroid sicca-cell, August 25, 1955, and pituitary gland and hypothalamus on March 14, 1956. She had no side reactions. She speaks fluently and well. Occiput is rounded out, and maturation is accelerated.

Case 8. G.E.G., female, 5 years old. Marked athetotic rigidity form of cerebral palsy with severe form of mental retardation.[13] On February 14, left sub-temporal decompression done in the ptyrian region. Angiomatous vessels were coagulated and destroyed by electric cautery. The brain turned a healthy pink color from a steel gray, and started pulsating again. She improved, was able to sit and eat. After a year, she could sit, stand and walk, but the athetotic movements were marked. On June 18, 1955 the Abderhalden urine tests showed frontal, parietal, gross and temporal lobes of the brain, and the brain stem hypofunctioning. She received temporal and parietal cerebral lobe sicca-cells in separate intramuscular injections on August 10, 1955, and frontal lobe and brain stem sicca-cell injections on February 23, 1956. Since then, she lost a great deal of the athetoid movements. She runs about and rides a bicycle well. She climbs and goes up and down stairs. She understands what is said to her and obeys. She babbles a great deal, anxious to talk. The only side reaction was a skin rash and slight fever which cleared up. There were no other effects. The parents are amazed, happy and thrilled at this progress.

Case 9. S.M.S., female, 19 years old. Seen for the first time February 1, 1954. She represents an untreated, neglected case of congenital acromicria syndrome (mongolism); stout, clumsy, and markedly retarded. She was placed immediately on a high protein

diet and low carbohydrate and fat diet, fat soluble vitamins, and minerals and Aquasol E. She showed progress. On May 18, 1955 her Abderhalden urine tests showed moderately strong pituitary gland, mild thyroid gland, frontal and parietal lobe brain deficiency. She received pituitary and thyroid sicca-cell therapy August 22, 1955, following the frontal and parietal cerebral lobe sicca-cells on July 18, 1955. She matured a great deal, talks much better and sensibly, and improved socially. She had no side reactions. The parents are happy about the progress.

Case 10. F.P., female, 5 years of age. Seen for the first time September 20, 1954. Case of moderately severe type of congenital acromicria syndrome with mongoloid features. No speech, muscle incoordination, and poor reflexes. May 25, 1955 the Abderhalden urine tests showed hypothalamus, pituitary thyroid, and thymus deficiencies in function. She received anterior pituitary, thymus, frontal lobe, thymus again, fetal frontal lobe again, thyroid gland, twice, and finally March 4, 1955 she was given female placenta sicca-cell injections. Her mother being a physician, under direction, gave her the intramuscular injections. I gave the first one. The only side reactions were local induration and moderate temperature rise after the thyroid and placenta sicca-cell injections which cleared up the next day. She is improving in muscle tone and coordination. She speaks several words, plays with her dog and feeds him. She runs about, up and down stairs, and is aware of everything in her environment and understands well. She is maturing and her occiput is also rounding out.

Case 11. J. C., female, 8 years of age. Seen for the first time December 2, 1954. She is a case of congenital acromicria syndrome with mongoloid features. Her urine Abderhalden tests showed hypothalamus, pituitary, thyroid and thymus gland deficiencies. She received one pituitary, anterior, female sicca-cell injections, 3 thyroid gland, 2 thymus gland, 2 frontal lobe fetal sicca-cells, and 2 placenta sicca-cells injections. Each injection was singularly given and at different times with surgical asepsis precaution. She improved a great deal in gait, general muscle tone and coordination, speech, and general maturation. Her father is a prominent physician and hospital associate medical superintendent. The child attends a private school.

The several cases cited here are a cross section of the series of cases under study, and are given here, in a preliminary report of

the work with sicca-cell therapy which is continuing. From my experiences to date with the use of sicca-cell therapy, I have found it to be a safe, therapeutic measure.

Dr. Niehans,[14] in administering this therapy, tries to transplant small aggregates of cells instead of the heretofore transplant of whole glands by which he replaces surgery with the use of the hypodermic syringe. He found that not only gland cells are beneficial on glands, but the sicca-cells taken from organs such as the liver, heart, and kidneys benefit the specific organs. It seems that fetal cells, obtained from the organs of the still unborn animals, are more effective therapeutically, but glandular cells, obtained from very young animals soon after birth, are more effective for glandular conditions. Dr. Neihans recognized that the sicca-cell therapy method as opposed to entire gland transplants resulted in continuing beneficial results, and finally, there is nothing to fear from possible anaphylactic phenomena, or from severe side reactions, which seldom occur, i.e., less than 0.1 per cent. Even with repeated injections of similar cells, the records show uniformly favorable reactions. More important than the treatment given the retarded children is the prophylaxis, in an effort to prevent many of the preventable brain lesions from occurring through proper prenatal education, care and directives, as well as neonatal and post-natal prophylactic measures and directives.

I wish to express my gratitude and appreciation to Drs. Josephine A. Girard and Anny Elston for inviting me to address the Pediatric Staff at the New York Infirmary, Hospital for Women and Children; to Dr. Lidia G. Sogandares, President of the Asociacion Medica Nacional, de la Republica de Panama, for the invitation to address the members at their convention meeting at Penonomé, R. de P., and to Drs. H. de Varela, P. V. Nunez, J. Vallarino, L. Benedetti, C. Sousa, R. Crespo E. Burgos, and P. Moscoso and other members of the Pediatric Staff of the Hospital del Nino, for their kind co-operation.

This is a preliminary report. We must refrain from being too optimistic. There are many brain lesions which are extensive and irreversible, and naturally will give disappointing results with any form of therapy. Perhaps the use of Dr. Fry's supersonic apparatus will succeed in destroying such lesions, and, with the aid of sicca-cell therapy will help to stimulate the sluggish brain responses following the supersonic ray therapy. We must be conservative,

patient, and be satisfied to wait and observe for longer periods of time the results of the therapy, and future reports on same.

BIBLIOGRAPHY

1. Die Niehanssche Zellular-Therapie in der Praxis, Von Dr. med. Joachim Stein. Biologisch-Medizinisches-Taschenjahrbuch, 1955.
2. Lettré; Renate: Zellkonfrontation in der Gewebekultur. Zellular-Therapie, in Wissenschaft und Praxis, No. 8, July 1955.
3. Dr. Kaiserling: Experimentelle und morphologische Untersuchungen am lymphatischen system nach Trockenzellinjektion. Wissenschaft und Praxis, No. 8, pp. 5-7, July 1955.
4. Goos: Wissenschaft und Praxis, pp. 8-9, July 1955.
5. Maischeim: Wissenschaft und Praxis, No. 8, pp. 7, July 1955.
6. Tier and Lorenz, et al.: Correspondence.
7. Ibid. #6.
8. Sterling, J. A. and Goldsmith, R.: Total Transplant of Thyroid Gland Using Vascular Anastamoses. Am. J. Surg., pp. 624-628, April 1954.
9. Peer, L. A. and Walker, J. C.: Surgery, 7:6-23; 73-84, 1951.
10. Haubold, H.: Artzliche Forschung, vom. 10, May 1955; Sonderdruck aus Niehans, die Zellulartherapie, Munchen-Berlin, pp. 128-161, 1954.
11. Zsako, Steven: Chief Resident Physician, Euclid-Glenville Hospital, Euclid, Ohio: Personal communication.
12. Griffel, A. Director, Medical Dept. of Pharmakos Ltd., Zurich, Switzerland. Personal communication as to the pharmaceutical preparation of sicca-cell and tests for its safety; views of Dr. Niehans.
13. Rosner, Samuel: Venous Angioma: A Cause of Cerebral Palsy. J. Internat. Coll. Surgeons, Vol. 22, 1:94-47, July, 1954.
14. Griffel, A.: Personal communication.

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FIRST STATISTICS ON SYSTEMATIC PREVENTION WITH BCG IN FRANCE. R. Mande. (Semaine hôp., Paris, 32:130-139, Jan. 14, 1956).

Vaccination with the Calmette-Guérin bacillus was made obligatory in France for certain groups in 1950 and for the population at large in some parts of the country in October 1953. At present it is practiced in at least 49 of the 90 states. In a year and a half, about 181,554 children have been vaccinated. They were selected for vaccination by the tuberculin test alone, which method had excellent results as shown by the small proportion of accelerated vaccinal reactions. Vaccination was usually accomplished by scarification, sometimes intradermally, with no particular difficulties. After vaccination, the proportion of positive reactions to tuberculin was high. Side-effects from the vaccination were uncommon. About one in 2,000 children suffered an adenitis. The only alarming type of illness was primary infection in the weeks following the inoculation, of which 12 cases were observed among 181,000 children. These primary infections would have occurred regardless of BCG vaccination.—*J. A. M. A.*

COMMERCIALLY AND HOME-LAUNDERED DIAPERS

A Comparative Evaluation of Their Role in the Cause and Prevention of Diaper Dermatoses

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In recent years a sharp rise in persistent contact dermatitis of the diaper area has been noted. It is frequently mistaken in diagnosis for so-called "diaper-rash."

The term "diaper-rash" is but a generalization covering five distinctly different irritations of the diaper region, each having its own etiology: intertrigo, ammonia dermatitis, perianal dermatitis, atopic dermatitis and contact dermatitis. Although these have been definitively described,[1, 2, 3] the term "diaper-rash" improperly persists; it impugns by innuendo the safely washed diaper as the cause of all buttock irritations.

One example, where the diaper plays no role in so-called "diaper-rash," is seen in the fact that treatment of stool irritation around the anus (perianal dermatitis) is dependent upon quick removal of the stool, plus exposure of the affected part to air, dry heat and application of a water-repellent, antiseptic cream, preferably containing a competitive proteolytic substrate.[2] The diaper itself has nothing to do with the cause of this type of dermatitis.

Correction of allergic dermatitis on the buttocks, of course, is dependent on removal of allergens, such as orange juice, milk and egg, just as it is necessary in treatment of chafing to remove friction between skin folds (with lotion or powder), or, in prickly heat to absorb excessive perspiration (with powder), or, in contact dermatitis to remove the irritant in the diaper.[3]

Ammonia and contact dermatoses involve the entire region of the buttocks. Ammonia dermatitis, due to ammonia liberated by urea-splitting organisms on the skin in contact with urine, may be distinguished from contact irritation by an attendant odor of ammonia in the wet diaper. Its correction may be brought about by rinsing the diapers in a non-volatile antiseptic solution,[4] pro-

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vided soap or detergent residue is thoroughly rinsed out beforehand. The three-cycle rinse of the home automatic has been shown to be insufficient to remove all residue.[1, 5] The result is that frequently the baby suffers a contact irritation from the soap or detergent aggravated by ammonia dermatitis.[5, 6, 7]

With the incidence of contact dermatitis in the diaper region apparently rising sharply, notably among infants wearing home-laundered diapers, certain of the more promotionally minded diaper services are detailing physicians about a new clinical entity called "home-laundry" rash as distinct from "contact dermatitis" caused by a baby oil, for example.

"Home-laundry" rash is said to be a detergent "burn" due to irritants, unwittingly put into the laundered diaper by the housewife in using popular automatic washing machine detergents, which the washing machine is unable to remove from the fiber because of the inadequacy of the rinse-cycle. The infant's wetting of the diaper, it is believed, sets up a reaction with the detergent residue which results in a scalding of the skin, especially when the wet diaper is allowed to remain on the infant any length of time. The inflammation is rendered acute with routine replacement of one irritating diaper by another. Hence, the diaper service takes the position that the physician should recommend a professional service aware of the hazards of improper diaper care.

Lipschutz and Fischer[1] recently commented on the increasing incidence of "home-laundry" rash. Grossman[3] forthrightly urged use of a franchised diaper service in preference to home washing of diapers.

Preference of physicians for commercially laundered diapers is evidenced by the recommendation made in an article in the American Medical Association's consumer magazine, Today's Health, entitled "Your Baby's Skin[8]," which admonishes, "if you can get it, good diaper service is better than makeshift diaper care. Hotter water and special handling makes diapers from a good company almost sterile."

Sherrill and Kinard[5] stated there is a 99.9 per cent reduction in total bacteria counts by the diaper service, as compared to 91.4 per cent reduction in home-washing procedures. These investigators point out that sterility of diapers involves procedures which are completely impractical in home-washing, even in hospital nurseries.

Mack[3] demonstrated that twenty-nine housewives, each using

three test pieces, produced the following laundry performance on ten different types of automatic home washers, as compared with the 20-year performance levels (July 1, 1932 to June 30, 1952) of a commercial laundry owners association, representing some 4500 processed test pieces of the identical character of those used in the home automatic study.

COMPARATIVE PERFORMANCE

	Home Automatic	*Commercial Laundry*
Strength losses	16.2%	13.8%
Whiteness retention	89.2%	94.9%
Soil removal	36.6%	81.3%

The medical significance of this table is the wide disparity of soil removal between the home automatic (36.6 per cent) and the commercial laundry (81.3 per cent). It indicates a likelihood of inadequate removal of harsh detergents by home automatics operated by the group of housewives studied.

In the Spring of 1955 the Diaper Service Institute of America[11] conducted a study, as yet unpublished, of 109 home-washed diapers submitted from 36 cities in all sections of the country. It was found that 92 home-washed diapers or 84.4 per cent did not meet the minimum passing standards for total bacterial count, coliform bacteria and pH Value required of commercially laundered diapers under the Diapers Service Institute of America's "Protected Diaper" program.

PLAN OF PRESENT STUDY

In a realization of the importance of proper diaper laundering in preventing the development of two types of "diaper-rash," i.e., ammonia and contact dermatoses, a study was undertaken to evaluate the quality of home-washed diapers as compared to commercially serviced diapers laundered in keeping with recognized standards of the National Institute of Diaper Services and the Diaper Service Institute of America.

Diaparene Chloride was selected for use as the antiseptic in this study for several reasons. Latlief, et al., pointed out that the most widely sold diaper antiseptic is Diaparene Chloride.[9] Its recommended minimal dosage is only one to two ounces per hundredweight dry weight diapers. The physician is well acquainted with this antiseptic as a surgical fabric rinse, and for topical application in the forms of ointment, powder and lotion. It is supported with

the longest bibliography in pediatric dermatology, and is the only one described in New and Non-official Remedies of the American Medical Association's Council on Pharmacy and Chemistry.

The sample was composed of one hundred commercially laundered diapers and the same number of home-washed diapers, all collected in Cleveland, Ohio.

Questionnaires regarding the washing procedures used by each of 100 families were secured along with the sample diaper. These questionnaires indicated that the average home laundering method consisted of a cold soak, one hot sudsing and three rinses. These findings were comparable to those reported by the American Institute of Laundering.[10]

Only two families employed a rinse antiseptic, while none used a sour or softening agent.

The commercially laundered diapers were obtained from routine batches of a large diaper service.* These diapers were laundered in accordance with the following method:

COMMERCIAL WASH FORMULA

Operation	*Water Level (Inches)*	*Temperature (°F.)*	*Time (minutes)*
1. Flush	12	½ hot-½ cold	3
2. Flush	12	hot 180°	3
3. Flush	12	hot 180°	3
4. Break (alkali & soap)	6	hot 180°	5
5. Soap (Ivory)	6	hot 180°	5
6. Bleach bath (6 oz. dry bleach, 1 pt. Calgon)	6	hot 155°	10
7. Rinse	10	hot 180°	4
8. Rinse	10	hot 180°	4
9. Rinse	10	hot 180°	4
10. Diaparene rinse	10	½ hot-½ cold	4
11. Rinse-sour & softener	10	cold	7
		Total washing time	52
		Total running time	64

*West End Diaper Service, Cleveland, Ohio.

TESTING PROCEDURES

All diapers were subjected to bacteriological and chemical testing in order to detect the presence of offensive organisms which could contribute to the development of dermatoses, and to detect the presence of residual detergent which could cause contact dermatitis.

In addition, the residual antiseptic properties of all diapers were determined in order to discover the effectiveness of the protection

offered by the diaper in helping to prevent ammonia dermatitis due to the effect of urea-splitting organisms on urine in the diapers.**

A questionnaire was filled in by each of the families from whom diapers were obtained. The questionnaire obtained information concerning the type and brand of machine used, nature and duration of washing cycle and detergent, softener, antiseptic and sour used.

The procedure in current use for testing diapers submitted to the laboratories of the Association for Physiologic Research is as follows:

1. The paper wrapper (envelop, etc.) is carefully opened and the diaper removed and placed on a sterile towel, using sterile forceps to make the transfer.

2. With sterile forceps and scissors a diaper section, approximately one inch wide, is cut across the entire width of the diaper. This strip of diaper is placed in a sterile petri dish to be used as indicated below.

3. The larger portion of the diaper is placed in a screw-capped, wide-mouth bottle (1 quart fruit jar) containing 500 ml. sterile distilled water. The bottle and contents are shaken intermittently for a period of one-half hour.

4. Portions of the liquid from the bottle are distributed as follows:

   a. One ml. to eosin methylene blue agar (coliform bacteria).
   b. Five ml. to "full strength" lactose broth fermentation (coliform bacteria).
   c. One ml. to plain nutrient agar (total bacterial count).
   d. One ml. to Difco Urea medium (ammonia forming bacteria).
   e. One ml. to Brewers' Thioglycollate Medium (absolute sterility test).

5. A sample of water is tested for pH on a Beckman glass-electrode potentiometer (pH Value).

6. The section of fabric first cut from the diaper is treated as follows (residual antiseptic properties):

   a. A section is cut approximately one inch square, placed in a sterile petri dish and then covered with melted and cooled (45°C.) agar previously inoculated with a suspension of *Bacterium ammoniagenes.*

**All testing was done at the laboratories of the Association for Physiologic Research, Los Angeles, California.

b. The above procedure is repeated using *Micrococcus pyogenes* var. *aureus*.

c. One gram amounts of the fabric are distributed in two sterile test tubes. To the tubes are then added 5 ml. of Difco Urea broth (4 d. above). To one tube is added 3 drops of a 24-hour broth culture of *B. ammoniagenes*, and to the other a culture of *Proteus mirabilis*. A control tube of urea medium without fabric is inoculated with the same organism.

7. Incubation of all broth tubes and agar plates is carried out at 37°C. for 48 hours and the results recorded in the Laboratory Report Form.

TABLE 1. *Comparison of Offensive Organisms Found Among* 100 *Home-Washed and* 100 *Commercially Laundered Diapers.*

	Total Bacterial Count		*Coliform Bacteria*		*Ammonia Forming Bacteria*		*Absolute Sterility*		
	Absent	*Present*	*Absent*	*Present*	*Absent*	*Present*	*0*[3]	*Sl.*	*Plus*
Home-Washed Diapers	28	72[1]	93	7	98	2	19	1	80
Commercially Laundered Diapers	99	1[2]	100	0	100	0	70	5	18

1. Range of number of organisms found per diaper was 2,000 to 39 million. The mean number of organisms for 100 diapers tested was 2 million.
2. One diaper showed presence of 8,000 organisms.
3. 0 = no growth. Sl. = Slight growth. Plus = fair to good growth of organisms in nutrient broth.

TABLE 2. *Comparison of Residual Antiseptic Properties of* 100 *Home-Washed and* 100 *Commercially Laundered Diapers.*

	Agar Plate Inhibition against*				*Inhibition of Ammonia from Urea using B. ammoniagenes*		
	M. pyogenes var. aureus		*B. ammoniagenes*				
	No Inhib.	*Good Inhib.*	*No Inhib.*	*Good Inhib.*	*No Inhib.*	*Fair Inhib.*	*Good*
Home-Washed Diapers	83	17	80	20	74	13	13
Commercially Laundered Diapers	0	100	0	100	0	0	100

*"Good" indicates 1 to 4 mm. complete inhibition of the test organisms around the sample patch diaper.

The results of these tests on the sample of home-washed and commercially laundered diapers are summarized in Tables 1 and 2.

TESTS FOR RESIDUAL IRRITANTS

The tests used for the detection of possible residual soap and detergent irritants in the washed diapers were carried out as follows:

a. To determine if the diaper still contains soap, the unused remainder of the extraction water (Step 3) and diaper are boiled for 5 minutes. The diaper is then removed and the water allowed to cool. An excess (0.5-1 ml.) of hydrochloric acid is added to the water and the latter boiled for 15 to 20 minutes. If soap is present the fatty acid portion will float to the surface of the liquid.

b. The same procedure is followed to determine the presence of synthetic detergent in the diaper. If there is still a suds on the solution after adding the acid, one can be quite certain that this is due to the presence of a synthetic detergent. In the latter instance there will be no fatty acid on the surface of the water.

The results of these tests are summarized in Table 3 along with a comparison of the pH of the diapers.

TABLE 3. *Comparison of pH and Residual Soap or Detergents Found Among 100 Home-Washed and 100 Commercially Laundered Diapers.*

	pH			*Residual Soap or Detergent*	
	Poor	*Good*	*None Found*	*Soap*	*Detergent*
Home-Washed Diapers	7.0 or greater	5.7-6.9			
	5	95	84	8	8
Commercially Laundered Diapers	0	100	100	0	0

DISCUSSION

The results of the bacteriological tests for the presence of offensive organisms in the diapers comprising the sample as summarized in Table 1 indicate the superiority of the commercial washing procedures for removing bacteria.

Only one diaper in the commercially laundered sample was found to contain a detectable number of organisms by the agar plate method. By contrast 72 per cent of the home-washed diapers showed significant numbers of bacteria, with many grossly contaminated specimens. The complete absence of ammonia-forming and coliform bacteria among the commercially laundered diapers is also significant. Although absolute sterility is not of great practical significance as a criterion for diaper safety, it is of

interest to note that 70 per cent of the commercially laundered diapers satisfied this rigorous test, while more than 80 per cent of the home-washed diapers failed.

Table 2 is concerned with the comparative residual antiseptic properties found among the sample diapers. These properties are especially significant since they indicate the value of the diaper in its role in preventing the action of urea-splitting organisms, such as *B. ammoniagenes* when the diaper is wet with urine. Effective inhibition of such organisms indicates the ability of the diaper to prevent ammonia dermatitis.

The fact that all the commercially laundered diapers showed good inhibition of *B. ammoniagenes* in urea medium attests to the efficacy of the commercial wash procedure and the effectiveness of the residual antiseptic employed.

The residual antiseptic property against *M. pyogenes* var. *aureus* exhibited by the commercially laundered diapers is significant in that it can be expected that these diapers will help to inhibit the growth of those organisms which might produce infection in areas rendered susceptible through the presence of dermatitis.

It can readily be noted that the great majority of the home-washed diapers exhibited no residual antiseptic properties and thus afforded no protection against organisms leading to ammonia dermatitis or organisms capable of invasion.

The results of Table 3 demonstrate the superiority of the commercial washing procedure with regard to the efficiency of the rinsing cycles in removing residual detergent. It can be expected, therefore, that such commercially laundered diapers will contain little, if any, materials which can serve as primary irritants. Conversely, a significant number of home-washed diapers in the sample were found to contain these potential irritants.

With regard to comparative pH results, the only diapers which could be considered unsatisfactory were found among the home-washed series. Five diapers exhibited pH values of 7.0 or higher, while all the commercially laundered diapers were below 7.0. The range of pH values for home-washed diapers was 5.8 to 7.5 with a mean of 6.4. The range of pH values for commercially laundered diapers was 5.7 to 6.3 with a mean of 5.98.

An attempt was made to correlate the findings on the home-laundered diapers with the information revealed by the questionnaires. No correlation could be found between the types of wash-

ing machine, duration of washing, detergents or softeners used, and the bacteriological or chemical findings.

SUMMARY

1. The problem of diaper rash is defined, and several of the causative factors are discussed. The occurrence of ammonia dermatitis and contact dermatitis is shown to be related to the efficiency of the diaper washing procedures.

2. The results of a comparative study of 100 home-washed and 100 commercially laundered diapers are presented. These findings illustrate the consistent superiority of commercially laundered diapers in the following respects:

a. Absence of offensive organisms.

b. Presence of residual antiseptic properties.

c. Absence of residual detergent.

In the series of 100 home-laundered diapers, 7 showed the presence of coliform organisms; 72 were found to harbor bacteria ranging in number from 2,000 to 39,000,000 per fabric; 2 showed the presence of urea-splitting bacteria; 16 were found to contain either soap or detergent; 74 were entirely devoid of residual antiseptic properties; and 5 were found to have high pH values.

Of the 100 commercially washed diapers, none was found to contain coliform or urea-splitting bacteria; only one was found to contain bacteria (8,000); none contained residual soap or detergent; all were found to have retained the antiseptic used in the final rinse in prevention of ammonia dermatitis; and all gave satisfactory pH values.

BIBLIOGRAPHY

1. Lipschutz, A. and Fischer, C. C.: Methylbenzethonium Chloride (Diaparene Powder) in the Care of Skin of Infants and Children, Am. J. Dis. Child., 89:596, May 1955.
2. Grossman, Leo: A New Specific Treatment of Perianal Dermatitis (with Diaparene Peri-Anal Creme) ARCH. PEDIAT., 71:173, June 1954.
3. Mack, P. B.: Bacteriostatic Agents and Sterilization in the Diaper Laundry. Pennsylvania State Coll., Diaper Serv., Fellowship res. repts., p. 32, 1949.
4. Cook, J. V.: The Etiology and Treatment of Ammonia Dermatitis of the Gluteal Region of Infants. Am. J. Dis. Child., 22:481, Nov. 1921.
5. Sherrill, J. C. and Kinard, C. L.: Sterility of Laundered Fabrics. J.A.M.A., 159:1478, Dec. 10, 1955.
6. Benson, R. A.; Slobody, L. B.; Lillick, L.; Maffia, A. J. and Sullivan, N.: A New Treatment for Diaper Rash. J. Pediat., 31:4, Oct. 1947.
7. Benson, R. A.; Slobody, L. B.; Lillick, L.; Maffia, A. J. and Sullivan, N.: The Treatment of Ammonia Dermatitis with Diaparene, J. Pediat., 34:1, Jan. 1949.
8. Eichenlaub, J. E.: Your Baby's Skin. Today's Health (A.M.A.), Feb. 1956.
9. Latlief, M. A.; Goldsmith, M. T.; Friedl, J. L. and Stuart, L. S. (U. S. Dept. of Agriculture): Bacteriostatic, Germicidal and Sanitizing Action of Quaternary Ammonium Compounds on Textiles: Part I. Prevention of Ammonia Formation from Urea by Proteus Mirabilis. J. Pediat., 39:730, Dec. 1951; Part II. Sanitization of Cotton Fabrics. J. Pediat., 40:599, May 1952.
10. American Institute of Laundering: The Sanitary Aspects of Commercial Laundering. Bulletin, 53, July 1942.
11. Diaper Service Institute of America, Philadelphia, Pennsylvania, Personal Communication, July 19, 1956.

PEDIATRICS AT THE TURN OF THE CENTURY

From time to time the Archives, which was the first Children's Journal in the English language, will reprint contributions by the pioneers of the specialty over fifty years ago. It is believed that our readers will be interested in reviewing such early pediatric thought.

MENINGOCOCCUS HYDROCEPHALUS*

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"Hydrocephalus" is not a primary disease. It is the terminal lesion of prior affections leading to an accumulation of serous fluid within the cranial cavity. The pathological condition is frequently, though not necessarily, associated with an enlargement of the head, an important point to remember. Referred to at times as dropsy of the brain or water on the brain, the affection may be acute or chronic, congenital or acquired. The etiology of the congenital cases has not been thoroughly elucidated. In regard to the acquired variety, we shall discuss but one form, the scope of our paper being limited to the consideration of cases complicating or following epidemic cerebrospinal meningitis. Councilman, and other excellent authorities, look upon the original trouble as meningoencephalitis, rather than a meningitis. The anatomical changes are not confined to the meninges—they may, and often do, involve the superficial layers of the brain and its blood vessels.

The effusion, variable in amount in individual cases, may take place at the onset or at any time during the subsequent course of the disease. Under favorable circumstances it may be absorbed; on the other hand, it may be so extensive as to lead to a fatal issue or influence unfavorably the future mental and physical status of the patient.

The fluid may be limited to one ventricle, though more commonly it is found in both, or it may occur in the subarachnoid space. In other words, we may have an external hydrocephalus, an internal variety, or a combination of the two, external and in-

*Read before the Nineteenth Annual Meeting of the American Pediatric Society, at Washington, May 9, 1907. The paper was prepared about two years ago, but was not presented, as we were awaiting the results of surgical measures resorted to in a series of cases by my colleague, Dr. H. M. Silver. The details of the various operations and the conclusions arrived at will appear later in a special article.

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ternal. The treatment of the external form, of the combined external and internal, differs materially in principle from that employed or resorted to in the internal or ventricular class.

The symptoms vary with the age of the patient. The head may or may not be enlarged, the increase in size depending upon the condition of the sutures and fontanels. When ossification has taken place the head does not take on the rapid increase characteristic of cases in which the sutures, etc., are still open. The shape of the enlarged head is, furthermore, influenced by the degree and extent of the sutural union.

In the infant with open fontanel and sutures, within 1 to 2 weeks from the onset, the tense and bulging anterior fontanel, with diminution and even absence of pulsation in this region, directs early attention to the condition.

The veins of the skull become enlarged and prominent and the various cranial diameters increase more or less rapidly, depending upon the activity of the inflammatory process and the amount of fluid present. The younger the patient, the more pronounced the sutural separation, the larger the fontanel and the greater the general increase in the size of the head.

Though it does not reach the proportions attained in the congenital type, the weight and dimensions may be such that the cranium is no longer supported by the muscles of the neck, but falls to one or other side, or the chin rests against the sternum. It has been said, "the body appears but as an appendage to the large caput." The distended fontanels and widely separated sutures in the extreme cases form a wide-open membranous space, extending forward to the root of the nose, between the separated frontal bone and laterally as far as the temporal bones. The rest of the body suffers from nutritional disturbance and defective innervation. Emaciation associated with loss of muscular power is marked.

In the very young, the bones yield readily to the increase in the internal pressure and the head is uniformly enlarged. In older infants the shape will vary, depending upon the extent of the sutural union and the original conformation of the head. The nonunited portions yield readily and the greatest increase is in the direction of the least resistance. In keeping with this circumstance there may be a greater accumulation of fluid in the anterior or posterior cornua of the ventricles and a greater protrusion of the corresponding part of the brain, the more pro-

nounced bulging being found in the frontal or occipital region, respectively.

The orbital plates, depressed by the excessive effusion in the anterior cornua, form an obtuse angle with the body of the frontal bone. The position of the eyes is affected, being pushed downward and forward. The sclerotics exposed above, the iris and pupil being partly covered by the lower lid, gives rise to a ghastly expression from under the prominent forehead.

In the posterior basilar type, in addition to the corresponding prominence, there is marked retraction of the head, together with arching backward of the spine. In extreme cases the occiput and sacrum may be in apposition.

It is hardly necessary to say that characteristic nervous symptoms, to be discussed later, are present and form part of the clinical picture.

In cases where the head is normal or but little increased in size (the sutures, etc., having been obliterated before the onset of the original disease) we are compelled, in arriving at a diagnosis, to rely upon the nervous symptoms produced by the effused fluid.

Diagnosis may be more or less difficult.* The clinical manifestations are about as follows: Within a week or two from the onset of the cerebrospinal meningitis we notice, notwithstanding a rather low or irregular temperature, little or no improvement in the mental condition. The patient remains more or less apathetic or may be comatose. Recurrent vomiting is noticed and occasional convulsions occur. Emaciation takes place rapidly, the abdomen is markedly retracted, the pupils are dilated and the distended veins of the forehead and head become more or less prominent. Strabismus may be present. Stiffness and retraction of the head persist. The temperature is low or subnormal for days and weeks, or is elevated in a very irregular manner.

Wide excursions are also observed. In one of our recent cases a difference of 12°F. was recorded. Paroxysmal headaches and a hydrocephalic cry are common; pain in the head and neck may be continuous. Neuralgic pains in various nerve trunks are not uncommon.

*Koplik teaches that the MacEwen percussion of the skull in children and adults in whom the sutures are ossified will enable one to detect at an early stage of hydrocephalic effusion into the ventricles. He has "found that a percussion of the head following MacEwen's method as to the position of the patient, which should be upright, with the head slightly inclined to one side, the percussion being performed at the pterion, is a most valuable means of discovering the presence of hydrocephalus internus." A hollow tympanitic sound is obtained when fluid is present

In young patients the pulse is rapid; in the older it may be slow, full, intermittent or irregular in rhythm. Incontinence of urine and feces occurs particularly during the relapse. Various forms of muscular paralysis may exist. Muscular tremors of the face, tongue and extremities are frequently observed.

The unfavorable signs clear up now and then. The amelioration in the condition, though striking, unfortunately is too often but a delusive phase in the downward course. Consciousness may be regained, conversation become rational, the general nutrition improve and the sphincters regain their tone.

The general outlook appears to be bright; unexpectedly there is a return of the headache, coma, vomiting, with the other distressing symptoms, followed by a fatal termination in consequence of coma, respiratory failure, exhaustion or convulsions.

A number of exacerbations, with successive relapses, are apt to take place before death occurs.

The socalled cases of "acute dilatation" of the ventricles run their course within one to two weeks and even less; the more chronic may last for months and years.

Acute distention of the ventricles is not infrequent at the outset of the disease. Early in our experience and study of the cases at Gouverneur Hospital in the epidemic of 1904, it was found that in a number, large amounts of cerebrospinal liquor, under considerable pressure, would escape when lumbar puncture was performed early. In a few instances, by relieving the pressure, life was unquestionably prolonged or a fatal issue prevented. In the greater number, however, no benefit resulted and the unfavorable course was not retarded.

Deputy Coroner Dr. O. Schultz was impressed, in a series of cases which came to autopsy after an illness of twenty-four to seventy-two hours, by the evident amount of compression of the cortex, apparently due to the increase of fluid in the ventricles.

Treatment. As far as medicines are concerned, excepting possibly the iodides, no very gratifying results have been obtained. In some cases, nature has been kind, the process having been cut short before any great damage was done, and the patient continues to enjoy a fairly comfortable existence.

A limited number, notwithstanding the existence of hydrocephalus, grow up and show little or no mental change.

It is strange to what an extent the gray matter may tolerate

the distention and displacement and yet continue to perform its functions more or less perfectly under the conditions of increased pressure and defective or impaired nutrition. In exceptional cases, where the disease has been arrested, the faculties may continue to develop and in time attain the average. Cases have been recorded of exceptional brightness.

Prof. Von Hauseman, of the University of Berlin, who has recently examined the brain of Theo. Mommsen, the historian, states that he, like Hermann Von Helmholtz, the physiologist, and Adolph Wenzel, the painter, was the subject of hydrocephalus. He suggests that on this basis an explanation may be offered of Mommsen's eccentricity, Wenzel's extreme irritability and occasional fainting fits, and the spasmodic seizures from which Helmholtz suffered (Medical Record, May 18, 1907, p. 821).

In others, paroxysmal headaches, pains in various parts of the body, inability to engage in mental work, etc., are reminders of the attack. Idiocy, epilepsy, blindness, deafness, various forms of paralysis, etc., make such patients a burden to themselves and their families.

As to operative interference, but two procedures admit of serious consideration. First, lumbar puncture. Under aseptic precautions and with the necessary experience, Quincke's lumbar puncture is a comparatively simple and safe measure. The best results are obtained in cases in which the effusion is limited to the subarachnoid space; in other words, in cases of serous meningitis or external hydrocephalus. Schultz, of the Posen City Hospital, reports that he has found that the intellect is cleared, the appetite improved, cramps disappear and the sleeplessness and vomiting are arrested after lumbar puncture in the hydrocephalic stage of cerebrospinal meningitis (New York Medical Journal, June 15, 1907, p. 1,136).

Such excellent results are exceptional in the experience of those of us who have studied the epidemic in New York.

Now and then a single lumbar puncture is followed by marked and rapid improvement in the symptoms. Whether this is a simple coincidence or a brilliant therapeutic result accomplished by intervention at the proper moment it is impossible to say.

I do not know of any sign or series of symptoms, a consideration of which will enable the observer to select this auspicious moment or predict the results in any case of lumbar puncture.

In the combined external and internal variety, lumbar puncture must be repeated at varying intervals whenever convulsions, paroxysmal headache, recurrent vomiting spells, increased apathy, etc., point to increased intracranial pressure. In some of our cases lumbar puncture was resorted to fifteen to twenty times; the highest amount withdrawn at one time was 85 c.c. Finally a "dry tap" may be noted. Fluid is not found, as the channels of communication between the ventricles and the arachnoid space have been obliterated or the structures at the base of the brain have become so adherent as to prevent the escape of fluid from the ventricles to the subarachnoid space. The pathological conditions have, therefore, transformed the case into the ventricular variety or internal hydrocephalus.

In cases in which, in addition to the effusion, there are marked evidences of cortical changes (maniacal attacks, epilepsy, paralysis, etc.), though we may remove the fluid we cannot restore the integrity of the nervous structures. Cushing's operation of draining the fluid into the retroperitoneal connective tissues has been performed a number of times, without any ultimate success, in the combined external and internal types.

Finally, we come to the internal type—ventricular dropsy or chronic internal hydrocephalus—in which the foramina between the ventricles and subarachnoid space have been closed by inflammatory processes. Lumbar puncture is of no avail in this variety, and we are consequently forced to resort to ventricular drainage, a surgical measure employed by my colleague, Dr. H. M. Silver, in a series of cases in the Beth Israel Hospital. In only one of the patients operated upon did we get any encouraging results. In a few, though life was unquestionably prolonged, the mental state did not present a corresponding degree of improvement.

Notwithstanding the unfavorable and poor results obtained in our cases, all late and progressively growing worse, the operative procedures ought not to be condemned prematurely, nor should they be considered in the category of "sins which, committed aseptically, are readily forgiven." We are dealing with a most unfortunate pathological condition. The various operations thus far devised and resorted to in advanced cases offer, it is true, but slight hope of cure. Perhaps, an earlier diagnosis and an earlier resort to surgery, in selected cases, may give better results.

DEPARTMENT OF ABSTRACTS

Conducted by
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COMBES, B.: DAMON, A. and GOTTFRIED, E.: PIPERAZINE (ANTEPAR) NEUROTOXICITY. (New England Journal of Medicine, 254:223, Feb. 2, 1956.

An unusual case of piperazine toxicity, manifested by giddiness, torpor, a sense of detachment, incoordination and choreiform tremors, is presented. The patient was an adult being treated for pinworms. Failure to excrete the drug in the urine because of renal insufficiency was the probable cause of the toxic reaction. As with other drugs excreted by the kidney, caution should be observed in the administration of piperazine to patients with impaired renal function. AUTHOR'S SUMMARY.

HENDRIX, R. C. and GOOD, D. M.: FIBROCYSTIC DISEASE OF THE PANCREAS AFTER CHILDHOOD. CASE REPORT WITH NECROPSY AT 17 YEARS. (Annals of Internal Medicine, 44:166, Jan. 1956).

The characteristic signs of fibrocystic disease of the pancreas, chronic pneumonitis evolving from multiple episodes of respiratory infection and yellow, bulky foul-smelling stools, appeared in a female infant at the age of four months and persisted until her death at 17 years of age. The diagnosis was first established when the patient was 11 years of age. She was treated with pancreatin granules, sulfonamides, IM and aerosol penicillin, expectorants, postural drainage, aureomycin and terramycin at various times. In spite of numerous bouts of respiratory infection, she led a fairly normal life to within a few weeks prior to death. At necropsy a severe acute exacerbation of the chronic purulent pneumonitis was present. The acinar tissue of the pancreas was completely destroyed, leaving few dilated ducts and many large islets of Langerhans surrounded by fibrous and adipose tissue. There was patchy biliary cirrhosis apparently due to partial obstruction from extremely viscid bile. Bronchial mucous glands were large and contained abundant viscid material. These changes are those which led Farber to propose the name mucoviscidosis for this condition. AUTHOR'S SUMMARY.

DI SANT'AGNESE, P. A.: FIBROCYSTIC DISEASE OF THE PANCREAS, A GENERALIZED DISEASE OF EXOCRINE GLANDS. (Journal American Medical Association, 160:846, March 10, 1956).

Fibrocystic disease of the pancreas is an hereditary disease of children in which the exocrine glands are affected. It occurs in Caucasians but is rare in Negroes. In the past 15 years, 325 patients have been observed and followed at Babies Hospital. Attention was first focused on the pancreas, but it was soon realized that pulmonary involvement, frequently severe, was present in almost all cases. It was recently shown that sweat and salivary glands, and less often the liver, are consistently affected in this disorder. In patients with this disease the sodium chloride content of sweat is increased 2 to 4 times above concentrations found in normal individuals and in a variety of other conditions. Massive salt loss through the sweat in hot weather may cause the death of these patients. This finding is also of great diagnostic assistance. While fibrocystic disease of the pancreas has been difficult to diagnose in the past, the simplicity of the "sweat test" brings it within reach of most hospital laboratories. The fate of patients with fibrocystic disease of the pancreas is usually determined by the severity of the pulmonary involvement. The outlook depends on success in controlling the chronic respiratory disease with antibiotic agents. Our conception of the basic nature of fibrocystic disease of the pancreas has greatly changed in the last few years. At first it was thought to be limited to an abnormality of mucous secretion; however, the finding of the constant occurrence of an electrolyte abnormality of sweat has greatly broadened the concept by showing that many and perhaps all exocrine glands, mucus-producing and others, are affected. Furthermore, the occurrence of the characteristic sweat electrolyte pattern in relatives of known patients, with or without pulmonary involvement but with normal pancreatic function, has led to the belief that milder and incomplete forms of the disease exist. This generalized glandular disorder accounts for virtually all cases of pancreatic deficiency in the pediatric age group, for a majority of those with chronic (nontuberculous) lung disease, and for a third of children with cirrhosis of the liver and portal hypertension. It deserves, therefore, greater recognition by the medical profession than has been accorded it in the past. AUTHOR'S SUMMARY.

BOOK REVIEWS

Conducted by
MICHAEL A. BRESCIA, M.D., New York

YOUTH: THE YEARS FROM TEN TO SIXTEEN. By Arnold Gesell, M.D., Frances L. Ilg, M.D. and Louise Bates Ames, Ph.D. Pp. xv & 542. Price $5.95. New York: Harper & Brothers, 1956.

This book continues the story of development begun by Drs. Gesell and Ilg in their two previous books, "Infant and Child in the Culture of To-day," and "The Child from Five to Ten." In the same general format and style of presentation, the growth from age ten is followed through the sixteenth year. There is a wealth of detail presented which is important to both parents and professionals. It is the normal behavior of children, residing in the somewhat better than average home, in and near New Haven, Connecticut. Part I orients the reader to Gesell's philosophy of development and sets the tone for what is to follow. In Part II the maturity profiles for each of the seven ages are presented. Sometimes the wealth of detail obscures the general trend but, as in the earlier books, this is remedied by more concise formulations which follow in Part III. To me Part III, where aspects of development, such as the Growing Self, Anger, Humor, Self Care and Routines, Sex Interests, Ethical Sense and School Life are outlined, is of greater interest, but, undoubtedly the parent of a 13-year-old child would find Chapter 7, "Year Thirteen" of greater interest and help. Appendix A gives the statistical basis for the study, while Appendix B carries legal information about such matters as employment, school attendance, licenses to drive, hunt, purchase liquor and tobacco. Also included, here, is a meager statement about religious practices for the three principal American faiths; I wished this had been fuller. Ages for Scouting, campfire activities, and joining the Armed Forces are also given. All of this is most useful to have for ready reference.

Obviously, this book is a must for the pediatrist and general physician who doctor Youth. It can afford the basis for judging whether there is deviation to the extent that the parents should be advised to seek help. It can give the doctor a better understanding of a youth who formerly may have idolized his or her doctor but

now becomes critical of the running of the office, of the doctor's technique and even may express the desire to go to another, a younger, more modern doctor than the one who has cared for him or her since babyhood. Also, Youth may want their own doctor rather than the one who has been allied with the parents. To understand this Youth, his needs, his interests, as well as his vagaries of growth, is surely the job of his doctor. The Gesell-Ilg-Ames book will certainly help a doctor do his job with more confidence if not with greater skill. This, too, is a book which the doctor may safely recommend to troubled parents though it may not supply the answers if their youth-age son or daughter is really troubled.

HELEN THOMPSON, PH.D.

POLIOMYELITIS—PAPERS AND DISCUSSIONS PRESENTED AT THE THIRD INTERNATIONAL CONFERENCE. Compiled and Edited for the International Poliomyelitis Congress. Cloth. Pp. 567. Illustrated. Price $7.50. Philadelphia: J. B. Lippincott Co., 1955.

The papers and discussions which appear in this volume were presented at the Third International Conference which was held in Rome in 1954. These conferences are invaluable in not only presenting the problems and solutions of the present and projecting them in the future but also looking backward for a proper historical perspective. The discussions under the general heading of infection and immunity in poliomyelitis are most interesting and the differing views of Salk and Sabin were cogent. At the present time, when a practical immunizing agent is available, it is well to quote Prof. Caronia: "A cultivation of the virus by a method analagous to that of Salk and his collaborators was, in fact, realized by Flexner in 1913, by Amoss in 1914, by Tsen in 1917, by Smillie in 1918, by Sindoni and Maggiore in 1920 and by Sindoni and Miasi in 1924. . . . Sindoni and Miasi, 1924, prepared a vaccine inactivated by phenol . . . they began trials of vaccine prophylaxis in animals and in human subjects. Then deplorable events put a stop to the research which only recently has been resumed". Imagine the progress at this late date if the research mentioned had not been interrupted. The book, as a whole, contains a wealth of information and makes a valuable addition to one's library. The Italian translations are clumsy, otherwise the volume is technically perfect.

MICHAEL A. BRESCIA, M.D.

UROLOGIE DE L'ENFANCE. By Gaston Lauret, M.D. and Collaborators. Cloth. Pp. 441. Illustrated. Price 3,900 francs. Expansion Scientifique Française, Paris, France, 1956.

This is an excellent volume covering the protean urological problems of infants and children. The book is divided into three parts. The first part is devoted to symptomatology, urological examinations, functional disorders, including enuresis which incidently is not covered too well, and infections of the urinary tract. The second part takes up the many and varied congenital anomalies. The whole book is well illustrated with x-ray demonstrations of the various conditions. There are a total of 330 illustrations. The sketches illustrating some of the x-ray findings are a great help and decrease the language barrier for those who cannot read French. The third part of the book concerns itself with the acquired conditions, such as renal stones, tuberculosis of the urinary tract, neoplasms and the effects of nervous disorders on the urinary system. The book is most useful and a valuable addition to one's library.

MICHAEL A. BRESCIA, M.D.

LE DIABÈTE INFANTILE ET JUVÉNILE. By Pierre Uhry and Paul Duvas with the collaboration of E. Eliachar. Paper. Pp. 487. Illustrated. Price 3,200 fr. Paris: Masson & Cie., 1955.

This is a fairly complete text in the French language covering the subject of diabetes in the infant and young child. The balance of the book would have been improved by considering the problems of the infant born of diabetic mothers and including also a more complete coverage of the causes of hyperinsulinism. The factor glucagon, which is produced in the pancreas to raise blood sugar, was not mentioned in the text. This is a comprehensive text with a good index and bibliography.

MICHAEL A. BRESCIA, M.D.

THE YEARBOOK OF MODERN NURSING. Edited by M. Cordelia Cowan. Cloth, Pp. 446. New York: G. P. Putnam & Sons, 1956.

The myriad astronomical scope of nursing activities today calls for a yearbook with a composite view of developments applicable to the nursing field. The contents of the book include every nurs-

ing endeavor, from the art of nursing the patient to world progress in nursing. The one hundred and fifty contributing authors are recognized specialists and educators who have searched long to bring into one volume all the developments which contribute to our present progress in nursing. Nursing, at last, has become a profession with standards and its own code of ethics. The chapters "Basic Programs in Nursing Education" and "Advanced Programs in Nursing Education" will help clarify the objectives and the broadening interpretation of nursing practice. Since a profession must continually evaluate its contribution to society, the discussion on the methods of teaching in the paper "Human Relations in Nursing" has dynamic impact in our present changing climate. This book has discriminating use. I recommend it for hospital libraries, college libraries, vocational guidance agencies and public health agencies. It needs widespread distribution for the use of many. It is a valuable reference and will save time and effort of any individual or nurse in quest of knowledge on nursing progress.

ELSIE MECHTA, R.N.

ANESTHESIA FOR OBSTETRICS. By Robert H. Hingson, M.D. and Louis M. Hellman, M.D. Cloth. Pp. 344. Illustrated. Price $12.50. Philadelphia: J. B. Lippincott Company, 1956.

This volume is a combination text and reference book replete with charts, schematic drawings and statistics covering the entire field of analgesia and anesthesia in obstetrics. This is a valuable book for any physician practising obstetrics, to be read carefully and to be referred to frequently by the obstetrical anesthetist. The obstetrical nurse and resident can profit a gread deal by a study of this text. The book is highly recommended.

E. F. TARTAGLIONE, M.D.

EVERY LISTED PEDIATRIC SPECIALIST

was questioned by an independent research organization about an article published in the Archives of Pediatrics. These specialists were asked whether they agreed with the reprint material.

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b | **is "more easily digestible"**
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